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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/320,421	05/26/1999	LEONARD FORBES	303.586US1	4705

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EXAMINER

TRA, ANH QUAN

ART UNIT	PAPER NUMBER
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2816

DATE MAILED: 12/03/2001

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/320,421

Applicant(s)

FORBES ET AL.

Examiner

Quan Tra

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-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 October 2001.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 10, 11, 13-18, 20-24, 26-38 and 40-45 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 10, 11, 13-18, 20-24, 26-38 and 40-45 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

This office action is in response to the amendment filed 10/15/2001. Applicant's arguments have been fully considered but they are not persuasive. The rejection in the previous office action is maintained.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S. C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

2. Claims 10, 11, 13, 14, 17, 18, 20, 23, 24, 29, 33-38, 44 and 45 are rejected under 35 U.S.C. 102(e) as being anticipated by Austin (U.S. Patent No. 5982690).

As to claim 10, Austin discloses in figure 1D a circuit comprising: a pair of cross-coupled amplifiers (153, 155 and 154, 156), wherein each amplifier includes: a transistor of a first conductivity type (155, 156); a dual-gated metal-oxide semiconducting field effect transistor (MOSFET) a second conductivity type (153, 154), wherein the drain region of the dual-gated MOSFET is coupled to a drain region of the transistor of the first conductivity type in the same amplifier, is coupled directly to a gate of the first transistor of the first conductivity type in the other amplifier of the pair of cross-couple amplifiers, and is coupled to a gate of the dual gated MOSFET in the other amplifier of the pair of cross-couple amplifiers; a pair of input

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transmission lines (outputs of circuit 103), wherein each one of the pair of input transmission lines is coupled to another gate of one of the dual-gated MOSFET in each amplifier; and a pair of output transmission lines (lat, /lat), wherein each one of the pair of output transmission lines is coupled to the drain region of the first transistor and to the drain region of the dual-gated MOSFET.

As to claim 11, figure 1D shows the transistor of a first conductivity type is a p-channel metal oxide semiconductor (PMOS) transistor, and the dual-gated MOSFET include n-channel metal oxide semiconductor (NMOS) transistors.

As to claim 13, figure 1D shows the pair of input transmission lines are bit lines and the bit line capacitance are removed from the pair of output transmission lines.

As to claim 14, it is inherent that each bit line is coupled to a number of memory cells in an array of memory cells.

Claims 17, 18, 20, 23, 29, 33-38, 44 and 45 recite similar limitations of claims 10, 11, 13 and 14. Therefore, they are rejected for the same reasons. Further called for claim 29, it is inherent for the memory circuit comprising a processor (figure 4).

As to claim 24, figure 1D shows the memory circuit includes a folded bit line memory circuit.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 15, 16, 21, 22, 26, 27 and 30-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Austin (USP 5982690).

As to claims 15, 21, 26 and 30, Austin's figure 1D shows all elements of the claims except for the sense amplifier is coupled to a power supply voltage of less than 1.0 Volts. However, the selection of the power supply to be less than 1.0 Volts is seen as an obvious design expedient dependent upon particular environment of use to ensure optimum performance.

As to claims 16, 22, 27 and 31, Austin's figure 1D shows all elements of the claims except for the sense amplifier is able to output a full output sense voltage in less than 10 nanoseconds (ns). However, it is also seen as a design choice for designing the output speed of the sense amplifier to be able to output a full output sense voltage in less than 10 nanoseconds (ns) dependent upon particular environment of use to ensure optimum performance.

As to claim 32, Austin's figures 1D, 4 and 5 show all elements of the claim except for the processor and memory are formed on the same semiconductor substrate and integrated circuit. However, it is well known in the art that elements that form on the same semiconductor substrate and integrated circuit having the advantage of matching temperature and space and cost saving. Therefore, it would have been obvious to one having ordinary skill in the art to make the processor and the memory to be formed on the same substrate and integrated circuit for the purpose of matching temperature and space or cost saving.

5. Claims 28 and 40-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaneko et al. (U.S. Patent No. 6069828) in view of Austin (U.S. Patent No. 5982690).

As to claims 28 and 40, Kaneko et al. teaches in figure 2 a memory circuit, and a method thereof, comprising a number of memory arrays (two sides of sense amplifier 15); a sense amplifier (15), a complementary pair of bit lines (BL1, BL1, BL2, BL2) input to the sense amplifier, a number of equilibration (14a, 14b), and a number of isolation transistors (18a, 18b).

Thus, figure 2 shows all elements of the claim except for the detail of the sense amplifier.

However, Austin shows in figure 1D a sense amplifier circuit comprising a pair of cross-coupled inverters (153, 155 and 154, 156), wherein each inverter includes: a PMOS transistor (155, 156), a dual-gated NMOS transistor (153, 154) wherein the drain region for the dual-gated NMOS transistor is coupled to a drain region of the PMOS transistor; a pair of bit lines (outputs of 103), wherein each one of the pair of bit lines is coupled to a first gate of the dual-gated transistor in each inverter; and a pair of output transmission lines (out, /out), wherein each one of the pair of output transmission lines is coupled to the drain region of the dual-gated NMOS transistor and the drain region of the PMOS transistor in each inverter. Austin's amplifier circuit having the advantage of reducing power dissipation. Therefore, it would have been obvious to one having an ordinary skill in the art to use the Austin's sense amplifier circuit for Kaneko et al.'s figure 2 for the purpose of reducing power dissipation.

As to claim 40, Austin's figure 1D shows all elements of the claims except for the sense amplifier is coupled to a power supply voltage of less than 1.0 Volts. However, the selection of the power supply to be less than 1.0 Volts is seen as an obvious design expedient dependent upon particular environment of use to ensure optimum performance.

As to claim 41, Austin's figure 1D shows all elements of the claims except for the sense amplifier is able to output a full output sense voltage in less than 10 nanoseconds (ns). However,

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it is also seen as a design choice for designing the output speed of the sense amplifier to be able to output a full output sense voltage in less than 10 nanoseconds (ns) dependent upon particular environment of use to ensure optimum performance.

As to claim 43, from the rejection above, it is inherent for the sense amplifier removes the bit line capacitance from a pair of output nodes of the sense amplifier.

Response to Arguments

Applicant does not provide any prior art that teaches the claimed dual-gated MOSFET transistor to show the structure of the dual-gated transistor as shown in the drawing is well known. As best understood by the drawing, a dual-gated MOSFET transistor comprises two MOS transistors connected in parallel. Austin's figure 1D shows a circuit (e.g. 127) comprises two MOS transistors connected in parallel. Therefore, circuit 127 can be considered as a dual-gated MOSFET transistor.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

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CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. These references are cited as interest because they show some circuits analogous to the claimed invention.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quan Tra whose telephone number is (703) 308-6174. The examiner can normally be reached on Monday to Friday from 7:40 am to 4:20 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Callahan, can be reach at (703) 308-4876. The fax phone number for this group is (703) 308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.



QT

November 19, 2001



Toan Tran
Primary Examiner